

# Specifications Needed in Repair and Maintenance of Roads and Bridges

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The subject of specifications, in one aspect or another, has been discussed many times at past Road Schools. Most of these previous discussions have dealt primarily with the general basic principles of writing specifications for work done by contract and only incidentally with work done with the counties own personnel and equipment.

You probably know that specifications for contract work include the so-called "general clauses" and "specific clauses". The general clauses cover various phases of the work and certain possible contingencies which may or may not arise during the construction operations and are required mainly because the work is done under contract. I do not intend to discuss these general clauses, but will refer you to the Proceedings of the Purdue Road School for 1930 in which you can find an excellent discussion by Professor G. P. Springer of Purdue. Another discussion can be found in the Proceedings of the 1939 Road School. Also you can use the general clauses in the Standard Specifications of the State Highway Commission of Indiana as a basis for writing the ones you will need in your contract work.

A discussion of the basic requirements that should be contained in the specific clauses will be found in these same proceedings. These specific clauses describe or define the materials and the various phases of the work from the viewpoint of the engineer. They probably should more properly be called the technical clauses. These are needed both in work done under contract and in work done with the counties own personnel and equipment. I will outline only briefly the basic requirements of these specific clauses.

Specific clauses should be given appropriate headings. For convenience they should be arranged in the order in which the work will probably be done. Each item of work should be covered,

generally including a description of the item, materials to be used, methods of construction, and how the item will be measured and paid for.

Various materials, such as steel bars, lumber, pipes and cables, are carried in commercial sizes. For reasons of convenience and of economy these standard sizes should be used whenever possible.

Special brands or patented articles should not be specified. Require materials of certain grade or meeting certain test requirements. Require good materials and good workmanship, but do not expect perfection. Require material of a quality satisfactory for the work contemplated. Sometimes it is not economical to use the best grade of material, a lower grade may give satisfactory results at considerably less cost. For each and every purpose there is one most economical material which can be used. Higher requirements will only add to the cost.

The basic objective of a specification is to obtain a certain grade of finished product and it is therefore desirable to specify for results, leaving the methods of work, as far as possible, to the ingenuity of the persons performing the work.

Engineering specifications cover all phases of activity and therefore no individual is capable of writing, from his own knowledge and experience, suitable specifications for all the engineering works and processes for which specifications are needed. Do not hesitate to refer to available sources of information in preparing your specifications. I will refer you to only a few of these sources of information. You will find the Specifications of the State Highway Commission of Indiana are excellent examples, both as to arrangement of clauses and the detailed requirements. Personally, I usually prefer to conform with these requirements, especially with respect to materials, although I realize that often it is economical for the counties to deviate somewhat from some of the specific requirements. When you do deviate from these or other "standard specifications" be careful that you do not permit the use of materials which will give unsatisfactory results.

Other sources of standard specifications are The American Association of State Highway Officials, The American Society for Testing Materials and The Federal Specifications Board, as well as other State Highway Commissions.